FINAL REPORT

2020/2021 SCHOOL YEAR

ADOLESCENT ORAL HEALTH CAMPAIGN

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UTAH DEPARTMENT OF HEALTH

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INTRODUCTION

During the 2020-2021 school year, the Oral Health Program (OHP) continued implementing the Adolescent Oral Health Campaign (AOHC), which is an intervention designed to educate middle school students about oral health care. The vision of the AOHC is to encourage positive oral health behaviors and increase participation and utilization of preventive dental services. For the past five school years, the AOHC has targeted middle school and high school health classes in schools along the Wasatch Front. All educational presentations given during the 2020-2021 school year were done virtually through Zoom due to the pandemic.

GOALS & OBJECTIVES

.he primary goals of this intervention coincide with Healthy People 2020 guidelines to:

- OH-1.3 Reduce the proportion of adolescents aged 13-15 years with dental caries experience in their permanent teeth.
- OH-7 Increase the proportion of children, adolescents, and adults who used the oral health care system in the past year.
- OH-8 Increase the proportion of low-income children and adolescents who received any preventive dental service during the past year (ODPHP, 2021).

These goals also align with Utah's National Performance Measure (NPM) 13B, "Increase the percentage of children ages 1–17, who had a preventive dental visit in the last year" (Benjamin, 2010).

One of the objectives of the AOHC is to increase oral health knowledge among youth. Topics addressed include healthy gums, bacteria-causing cavities, and tobacco use. The other primary objective of this intervention is to increase positive oral health behaviors and other healthy behaviors adolescents can control. These healthy behaviors include brushing teeth twice a day, flossing daily, limiting sugary drinks such as juice, soda, and energy drinks, and going to the dentist at least once a year for preventive services.

Low cost dental resources are printed in an educational tri-fold handout and made available to all students, health teachers, and school nurses. In order to measure the effectiveness of the intervention, the students complete anonymous pre- and post-tests that are designed to cover each of these topics.

The following report discusses results of the AOHC from the 2020-2021 school year.

METHODS

Intervention

This intervention was designed based upon principles in the Health Belief Model. The Health Belief Model, a psychological health behavior change model, was used to address perceived barriers to good oral hygiene habits (Becker, 1974). These barriers were addressed during the educational portion, and solutions were provided by the instructor. The AOHC uses this model to help students understand their susceptibility to oral health problems and the benefits that come from maintaining good oral health habits (LaMorte, 2019).

A one-time oral health intervention was designed specifically for middle school and junior high students. The educational intervention consisted of a 45 to 60 minute presentation given by the Oral Health Program (OHP) Oral Health Educator, and OHP interns.The oral health presentation covered many topics including proper brushing and flossing habits, healthy nutrition choices (such as limiting sugary snacks and drinks), how a cavity is formed, how to prevent gum disease, how to properly clean braces and retainers, and the importance of regular dental care. Anonymous pre- and post-tests were administered to all students before and after the educational intervention. These assessments asked knowledge-based questions about oral health topics addressed in the educational presentation. In addition, educational brochures containing a list of local safety net dental clinics were made available to all students.

Data Collection

The students completed an online pre-test before the intervention using REDCap, a secure, web-based data capture application hosted at the Utah Department of Health (Harris et al., 2009). Due to covid and the virtual environment in which these presentations were given pre and post-test could only be taken online. No paper option was available. After the educational segment, students immediately took the post-test assessment. The pre-test, educational intervention, and post-test were completed in one class period. These assessments asked knowledge-based questions about oral health topics addressed in the educational presentation. Additionally, the survey contained demographic questions about a student's age, ZIP code, and race. Furthermore, questions about access to dental services, such as the last time the student saw a dentist or dental hygienist, were also included in the assessment.

METHODS

Survey Design

The survey instrument for 2020 was adopted from previous AOHC surveys. No additional changes were made for the 2020-2021 school year.

School Participation

The oral health educator contacted a number of middle school health teachers in school districts across the Wasatch Front. Scheduling for the educational intervention was based upon teacher response. The Oral Health Program focused its efforts along the Wasatch Front due to program constraints which include travel time and funding. As a result, schools were not randomly selected for the campaign. Additionally, school participation was a little less than in previous years due to the pandemic. School closures in the fall of 2020 made scheduling particularly difficult. Zoom presentations were given where possible.

Analysis

Average student age, distribution of student age, race, ethnicity, and responses to all survey questions were analyzed. Pre- and post-test responses to all survey questions were compared and analyzed. The effectiveness of the campaign was measured through pre- and post-tests completed by students in the classroom. Intervention success was defined as an increase of 15% or greater in students marking the correct answer on the knowledge-based oral health questions between the pre- and post-test responses. Complete response data from pre- and post-tests were downloaded from REDCap to a Microsoft Excel file and uploaded into SAS 9.4 for analysis (SAS Institute, 2021).

RESULTS

To avoid confusion, data presented from the 2020-2021 AOHC, will now be referred to as 2020-AOHC.

Intervention Reach

During the 2020–2021 school year, the OHP oral health educator, and OHP interns, provided presentations virtually to 13 schools reaching 1703 middle school students.

Demographics

Demographics of students at participating schools are presented in Table 1. Distribution of ages and student gender were calculated based on pre-test responses. Of the 1774 students who reported, the average student age was 13 years old. On the pre-test, 48.3% of students identified as female, 49.3% identified as male, and 2.4% identified their gender as Other.

Most students identified as White (71.4%), while the remainder of students identified as persons who are non-White: Hispanic (13.1%), Black/African American (2.6%), Asian (1.2%), American Indian/Alaska Native (2.3%), Native Hawaiian/Pacific Islander (2.0%), and “Other” (1.9%). Finally, 5.4% of students selected multiple races and were re-categorized as being two or more races.

STUDENT DEMOGRAPHICS

Table 1: Student Demographics

Student Demographics	Total Number of Students (n= 1774)
	n (%)
Missing	5 (0.3)
Gender	
Female	835 (48.30%)
Male	852 (49.30%)
Other	41 (2.40%)
Missing	5 (0.3)
Race	
American Indian/Native American	40 (2.3%)
Asian	22 (1.2%)
Black/African American	46 (2.6%)
Native Hawaiian/Pacific Islander	36 (2.0%)
White	1260 (71.4%)
Two or More Races	96 (5.4%)
Hispanic/Latino	231 (13.1%)
Other	33 (1.9%)
Missing	10 (0.6%)

ORAL HEALTH BEHAVIOR QUESTIONS

As noted previously, the survey included questions aimed at better understanding students' oral health knowledge and individual oral health behaviors. Only pre-test responses to oral health behavior questions are displayed below.

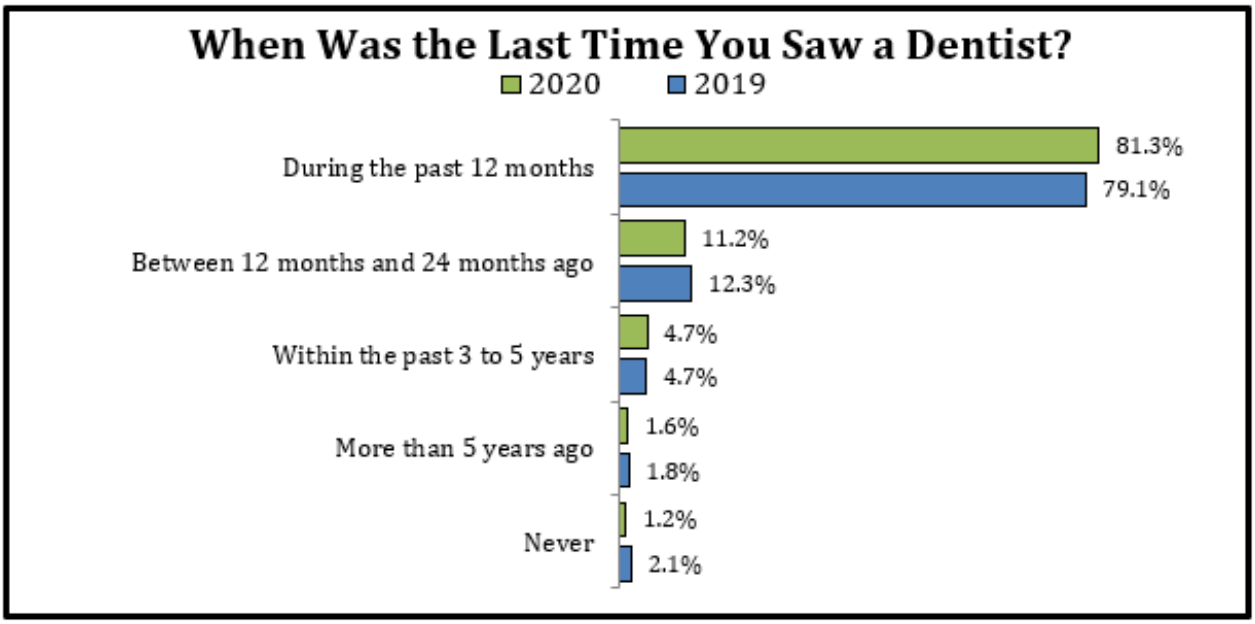
When was the last time you saw a dentist for a check-up, exam, teeth cleaning?

The majority (81.3%) of students in the 2020-AOHC reported having been to the dentist within the last twelve months. More than ten percent of students reported visiting a dentist within the last 12–24 months (11.2%). A small number of students reported having a dental visit within the past three to five years (4.74%), some reported seeing a dentist more than five years ago (1.6%), and 21 students (1.2%) indicated they had never been to the dentist (Figures 1 and 2).

Interestingly, the results of the AOHC Survey closely follow the state of Utah's Youth Risk Behavior Survey (YRBS) Question 86, "When was the last time you saw a dentist for a check-up, exam, teeth cleaning, or other dental work?" In the YRBS survey, 1,377 students (76.8%) reported going to the dentist during the past 12 months. (Youth risk behavior survey, n.d.)

Nonetheless, caution should be taken when comparing these results. The YRBS is a statewide survey primarily reaching 14–18 year old students, while the AOHC focused primarily on middle school students along the Wasatch Front and primarily surveyed 12–14 year old students. Additionally, this question was first asked as part of the AOHC in 2016. In 2017 the wording was slightly modified and then used again in 2018, 2019 and 2020. Previously, the question aligned with YRBS, as it included "other dental work." However, beginning in 2017, the removal of "other dental work" allowed the OHP to focus on utilization of preventive services.

Figure 1

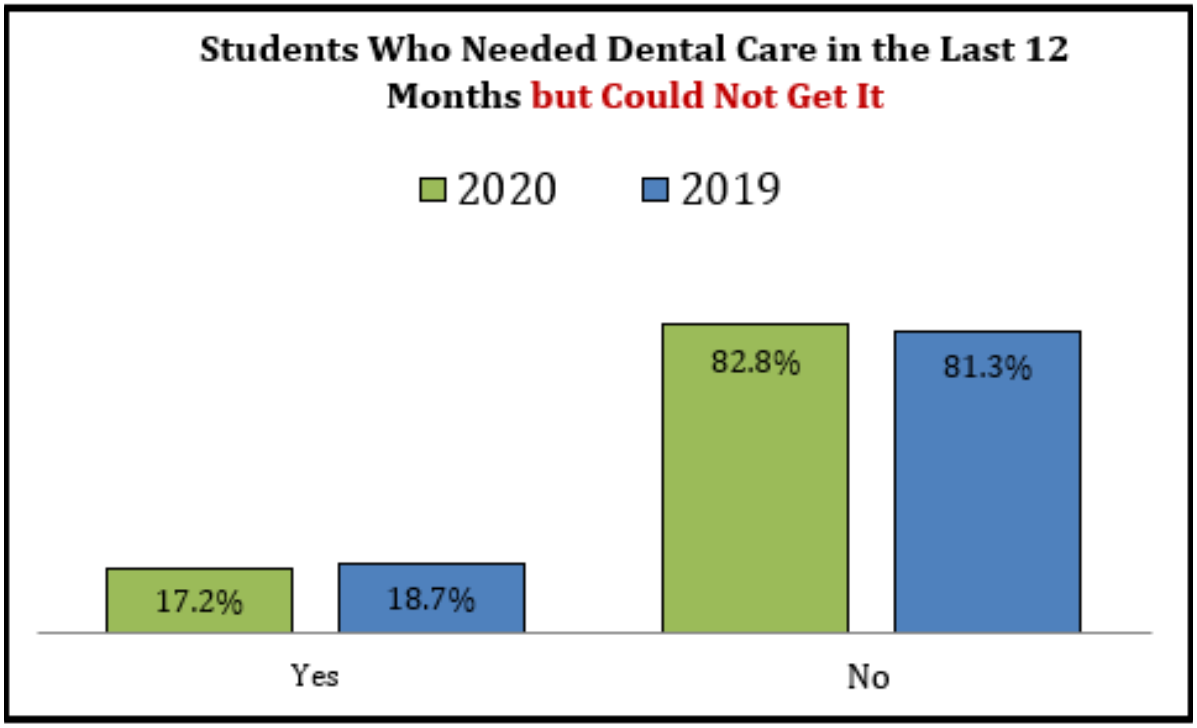


During the past 12 months, was there a time when you needed dental care but could not get it at that time?

In the National Health and Nutrition Examination Survey (NHANES), in addition to "Yes" and "No responses," this question has a 3rd response answer of "Don't Know." This response option was left off our 2020-AOHC survey to reduce confusion, and to stay consistent with the 2018-2019 and 2019-2020 school years (NHANES, 2019).

In the 2020-AOHC, 297 students reported needing some form of dental care, but not being able to get the care they needed, making up 17.2% of the 1725 students who responded to this question. Of those who responded, the other 82.8% of students responded "No," indicating they either did not perceive a need for dental care in the past 12 months, or they were able to access the care that they needed. These findings are similar to previous school years. In 2019-2020, 18.7% percent of students self-reported having needed care and were unable to get it, and 81.3% of the students reported they were able to get the care they needed (Figure 2).

Figure 2



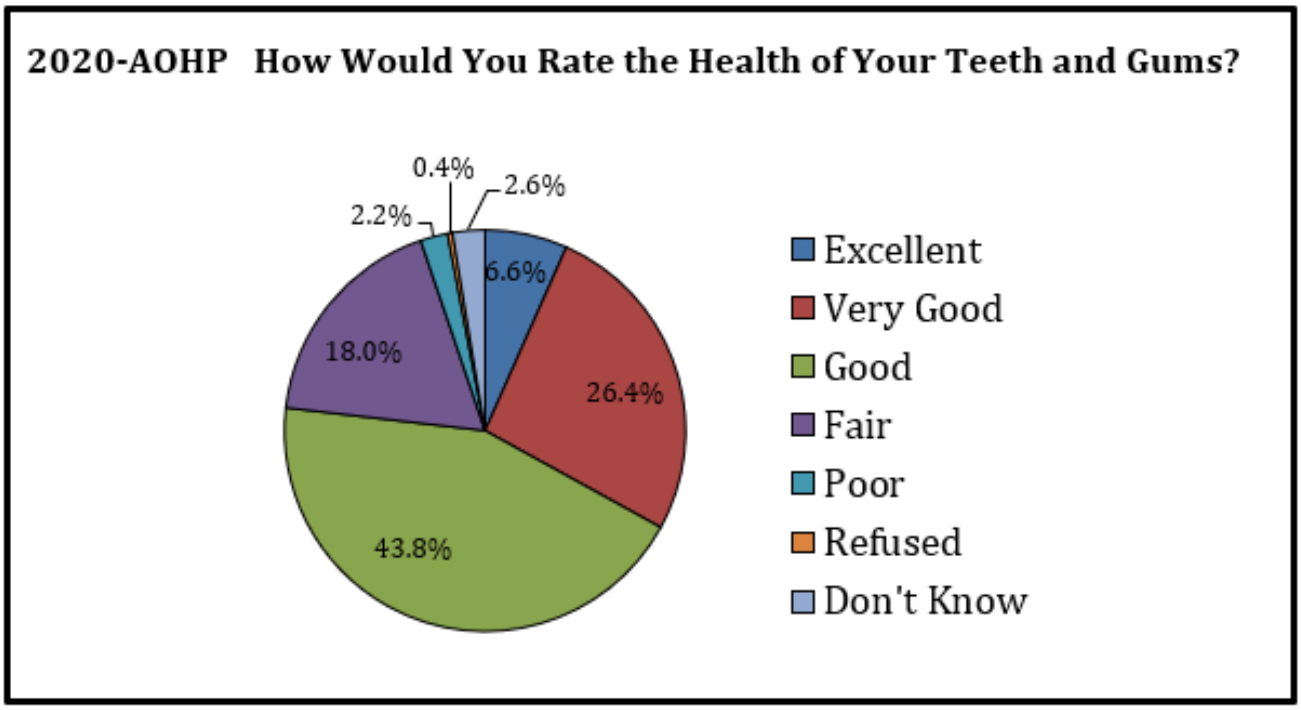
IIt is very concerning that in 2020-AOHC, 18.7% of students in this intervention self-reported they had not been to the dentist in the past 12 months, and 17.2% reported needing dental care but were unable to access the care they needed. We know preventive dental visits are imperative for optimal oral health. There are many barriers for these teenagers in accessing dental care. Scheduling conflicts for the adolescent, parents, and/or dental clinics can be a barrier to receiving care. Insurance coverage and income are also major barriers for many adolescents when it comes to accessing care. Data available on the Utah Public Health Indicator Based Information System (IBIS) displays an association between income and visiting the dentist. In the state of Utah in 2018, 47.3% of adults visited the dentist when their income was less than $25,000 a year, whereas 82.8% of adults visited the dentist when their annual income was $75,000 or more (IBIS, 2021). While parental income was not studied as part of this intervention, it may contribute to whether the adolescents were able to receive the care they needed.

Other barriers to accessing care include, but are not limited to, a lack of afterhours dental clinics, transportation, lack of providers, language, and other systemic constraints. The benefits of going to the dentist are addressed in the intervention, and options for low cost, safety net clinic offices were included in resources available to all students.

Overall, how would you rate the health of your teeth and gums? Would you say…

Students were asked to rate the health of their teeth and gums, allowing us to assess students' perception of their own oral health. Of the 1730 students who responded to this question, fewer than 7% of adolescents rated their oral health as being excellent (6.6%). The majority of students rated their oral health as either very good (26.4%) or good (43.8%). Approximately 20% of students rated their oral health as fair (18.0%) or poor (2.2%). A small remainder of students (2.6%) who responded to this question reported they did not know how they would rate their oral health, and 0.4% of students refused to answer the question. The option of refusal was added in 2019, but very few students refused to answer the question (Figure 3).

Figure 3



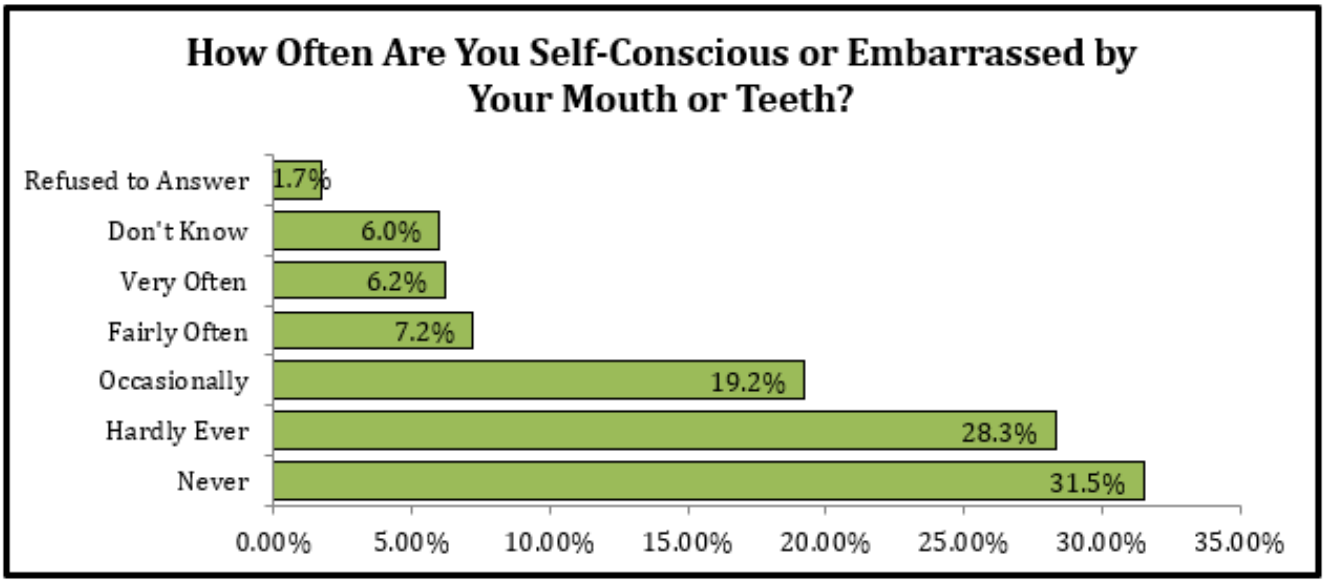
Poor oral health can lead to impaired speech development and reduced self-esteem (DHHS, 2020). It can also contribute to shyness, unhappiness, feelings of worthlessness, and reduced friendliness (Guarnizo-Herreno & Wehby, 2012). Students' perception of the health of their teeth and gums could affect their self-image.

How often during the last year have you been self-conscious or embarrassed because of your teeth or mouth? Would you say…

Physical health and mental health are closely related, and perception of self affects mental health greatly. Utah has seen an increase in youth depression and suicide. Data from Utah's 2019 YBRS indicated that 33.4% of 9th grade students felt sad or hopeless daily and consistently enough that they stopped doing usual activities for 12 months (IBIS, 2019a). The OHP wanted to collect data to see if the appearance of teeth, mouth, gums, and smile affect the way youth feel about themselves and determine whether this could be a possible cause of these feelings of depression and negative self-image.

For the 2020-AOHC, 1730 students responded to the question, "How often during the last year have you been self-conscious or embarrassed because of your teeth or mouth?" The largest percentage (31.5%) reported they never feel that way, which seems to be a positive outcome. However, 6.2% of participants very often feel self-conscious about the appearance of their teeth or mouth, and almost the same amount reported feeling this way fairly often (7.2%). This may not necessarily relate to the high rates of suicide or depression in Utah, but these are important measures to note overall when considering issues that affect young people (Figure 4).

Figure 4

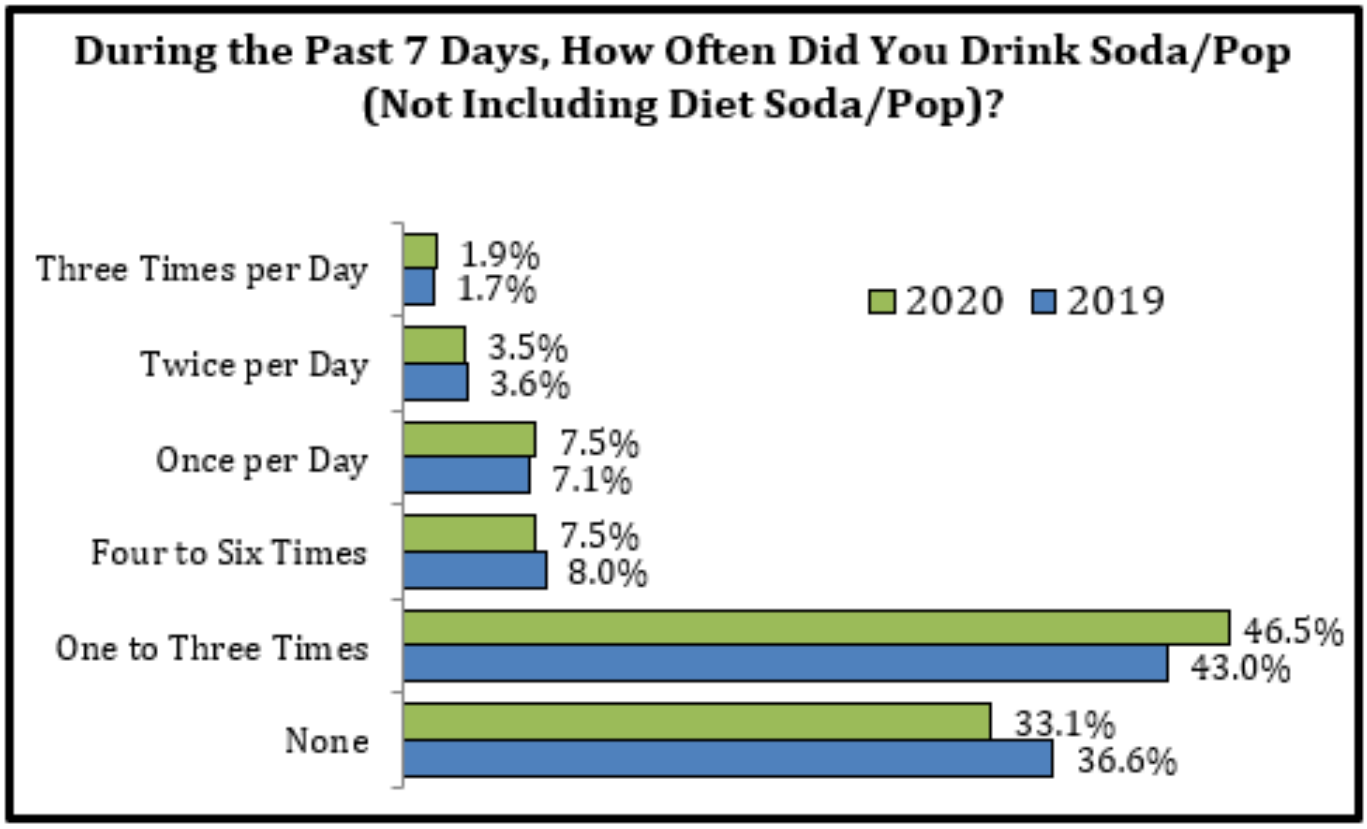


During the past 7 days, how many times did you drink a can, bottle, or glass of soda pop, such as Coke, Pepsi, or Sprite (Not including diet soda or diet pop)?

On the pre-test assessment, fewer than half of the 1730 students reported consuming one to three sodas over the course of the previous week (46.5%), and about one-third of students reported not consuming any soda during the previous week (33.1%). 12.9% of the students reported consuming soda on a daily basis, while 7.5% consume soda four to six times a week (Figure 5).

In the YRBS 2019 survey, 182 students (11.8%) reported drinking a can, bottle, or glass of soda pop in the past seven days. However, the results of the 2019-AOHC Survey have a much larger percentage of students who self-reported fairly frequent soda consumption compared with the state of Utah's YRBS. In the 2019-AOHC, 51% of students reported drinking soda 1-6 times in the past seven days (IBIS, 2019b). Nonetheless, caution should be taken when comparing these results. The YRBS is a statewide survey primarily reaching 14-18 year old students and the adolescent oral health campaign focused primarily on 12 to 14-year-old middle school students along the Wasatch Front.

Figure 5



Soda is a highly acidic and sugary drink that is especially damaging to tooth structure and leads to tooth decay. Each time we eat food or have a drink that contains sugar, the bacteria (primarily streptococcus mutans) in our mouth eats the sucrose in our diet and releases acid. The human mouth becomes acidic for 20-40 minutes each time it's exposed to food or drinks. During this time, the pH of the mouth often drops to a level where the tooth starts to demineralize or decay. The more frequently these acid attacks occur, the higher the risk of dental decay. That is the reason for asking the frequency of soda consumption (Loesche, 1996).

The language in the question "not including diet sodas or diet pop" was adopted from the YRBS-2017. Diet sodas may not have the same sugar content as regular sodas, but they are still highly acidic. Although diet sodas were not included in the survey questions, the risks of drinking both diet and non-diet sodas were covered in the presentation.

In the 2019-AOHC, this question was removed from the post-test to reduce redundancies and shorten the survey. However, on the post-test, a new question was asked about students' future intent of drinking soda.

Have you ever smoked an electronic cigarette or vaped?

In the 2020-AOHC, it was reported that 94.7% of students have not smoked an electronic cigarette or vaped. A small percentage (4.6%) reported trying or experimenting with electronic devices, and even fewer (0.7%) use these products regularly. This is an improvement from the percentages reported from the previous two years (Figure 6).

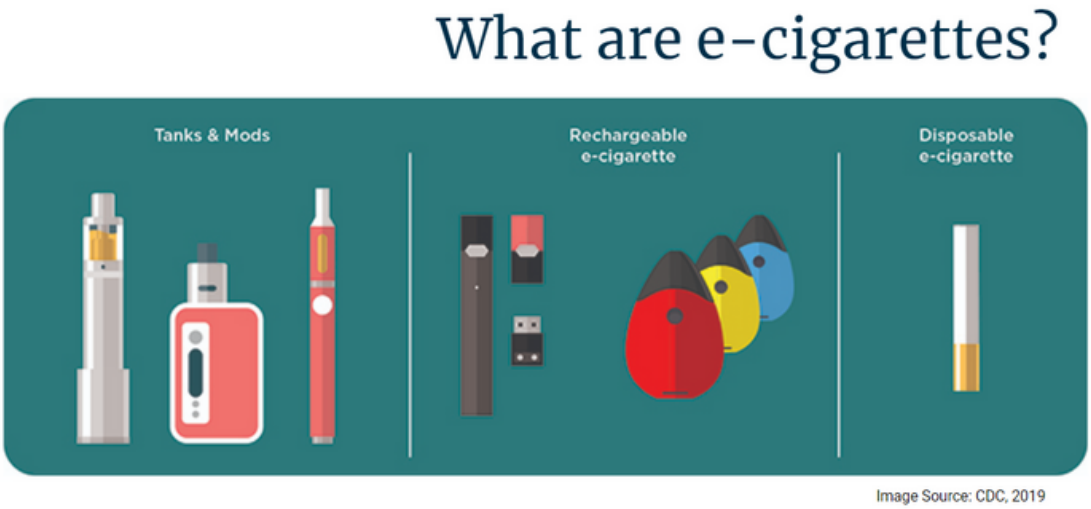
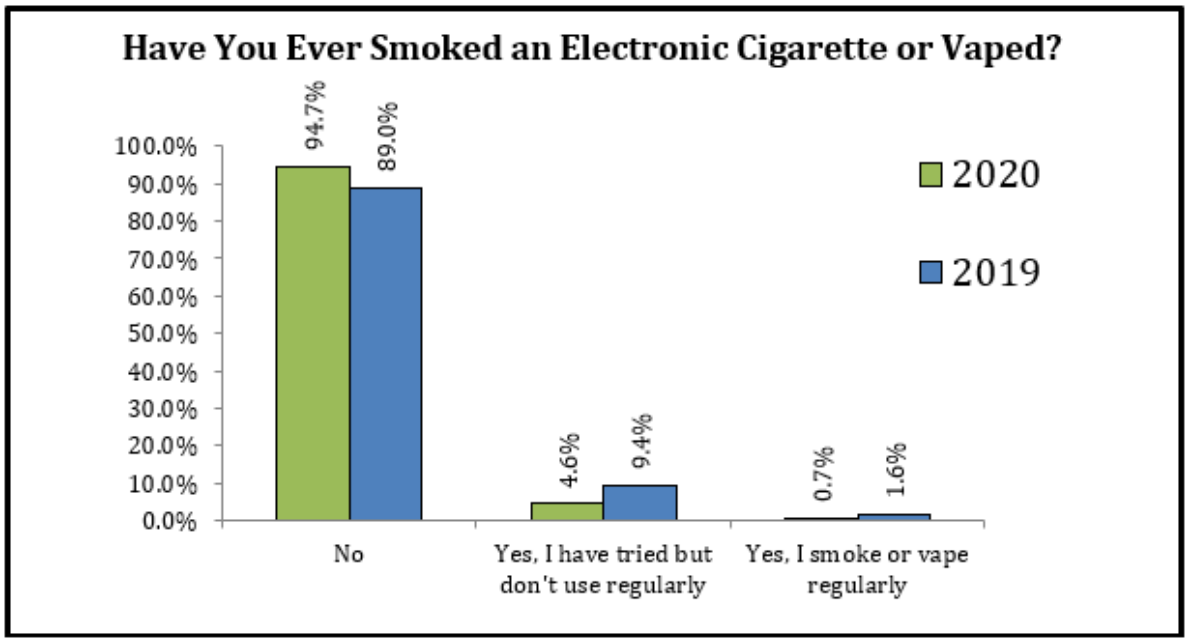


Image Source: CDC, 2019

"E-cigarettes are electronic devices that heat a liquid and produce an aerosol, or mix of small particles in the air." CDC, 2019

Figure 6



The OHP recognizes the increasing popularity of electronic cigarette usage among teens and young adults in Utah. Electronic cigarettes are less expensive compared with other tobacco products and feature many flavors (Blaha, 2021). According to the Vape Product Experimentation and Use Fact Sheet found in Utah's Indicator-Based Information System (IBIS), "In 2013, 2015, and 2017 Utah students were more likely to report use of electronic cigarettes or vape products than any other tobacco or nicotine products." The report also found, "In 2017, nearly one-fourth of Utah students in grades 8, 10, and 12 reported they had tried vape products (also known as electronic cigarettes, e-cigarettes, vape pens, or mods) and 11% reported current use" (UDOH, 2019). A study in 2018 followed a large group of adolescents over a year-long study and gathered their self-reported data of dental health issues related to their vaping and smoking habits. About 22% of the participants reported dental problems in the past year, and 7% reported past use of both tobacco and electronic cigarettes (Akinkugbe, 2018). We continue to emphasize that e-cigarettes are not safe and are highly addictive.

Due to the staggering rise in popularity of vaping products, the OHP decided to address the consequences of vaping and other tobacco products on the teeth, gums, and mucosal tissues in this campaign. Individuals who use e-cigarettes are at an increased risk of cavities, dry mouth, receding gums, bone loss, broken teeth, and burns from malfunctioning e-cigarettes (ADA, n.d.a; Manchir, 2018; FEMA, 2017; DHHS, 2020).

ORAL HEALTH KNOWLEDGE QUESTIONS

Topics covered in the educational intervention included cavities, gum disease, nutrition (with an emphasis on avoiding soda consumption), braces, and the importance of mouth guards while engaging in athletic activities. Questions geared toward assessing students' understanding of specific topics were asked in both the pre- and post-tests. A comparison of pre- and post-test responses for each of these questions is presented below. As stated in the intervention section of this report, the OHP considers the intervention a success if there is a 15% increase in students marking the correct answer between the completed pre- and post-tests. Table 2 shows all questions asked and the number and frequency of responses given for each answer.

Table 2: Survey Question Responses

Survey Question Responses (correct answer choice in **bold**)		
	Pre-Test	**Post-Test**
Survey Question	N *(%)*	N *(%)*
Is it common for healthy gums to bleed when brushing/flossing?		
No, bleeding gums is not normal	**989 (57.1)**	**1,481 (89.1)**
Yes, when you have a cold	26 (1.5)	10 (0.6)
Yes, sometimes	668 (37.7)	153 (9.2)
Yes, all the time	67 (3.8)	19 (1.1)
Missing*	3 (0.2)	2 (0.1)
Can toothpaste clear up pimples?		
Yes	314 (17.6)	136 (8.2)
No	**1,458 (82.3)**	**1,529 (91.8)**
Missing*	2 (0.1)	0 (0.0)
Which of the following chronic diseases is most common among children/teens?		
Asthma	313 (17.7)	30 (1.8)
Cavities	**1,128 (63.6)**	**1,589 (95.5)**
Hay fever	144 (8.1)	18 (1.1)
Obesity	188 (10.6)	27 (1.6)
Missing*	1 (0.1)	1 (0.1)
All of the following statements are true about cavities except for one. Mark the statement that is false.		
Cavities can spread from person to person	1,349 (76.2)	271 (16.3)
Cavities can get worse over time if not treated	98 (5.5)	97 (5.8)
Everyone gets cavities	**207 (11.7)**	**1,175 (70.7)**
Cavities are preventable	117 (6.6)	120 (7.2)
Missing*	3 (0.2)	2 (0.1)
How often is it recommended that you brush your teeth?		
Once a day	35 (2.0)	15 (0.9)
Twice a day	**1,314 (74.1)**	**1,497 (90.0)**
After every meal	406 (22.9)	146 (8.8)
Not sure/Don't know	18 (1.0)	6 (0.4)
Missing*	1 (0.1)	1 (0.1)
Note. * Missing not calculated into percentages		

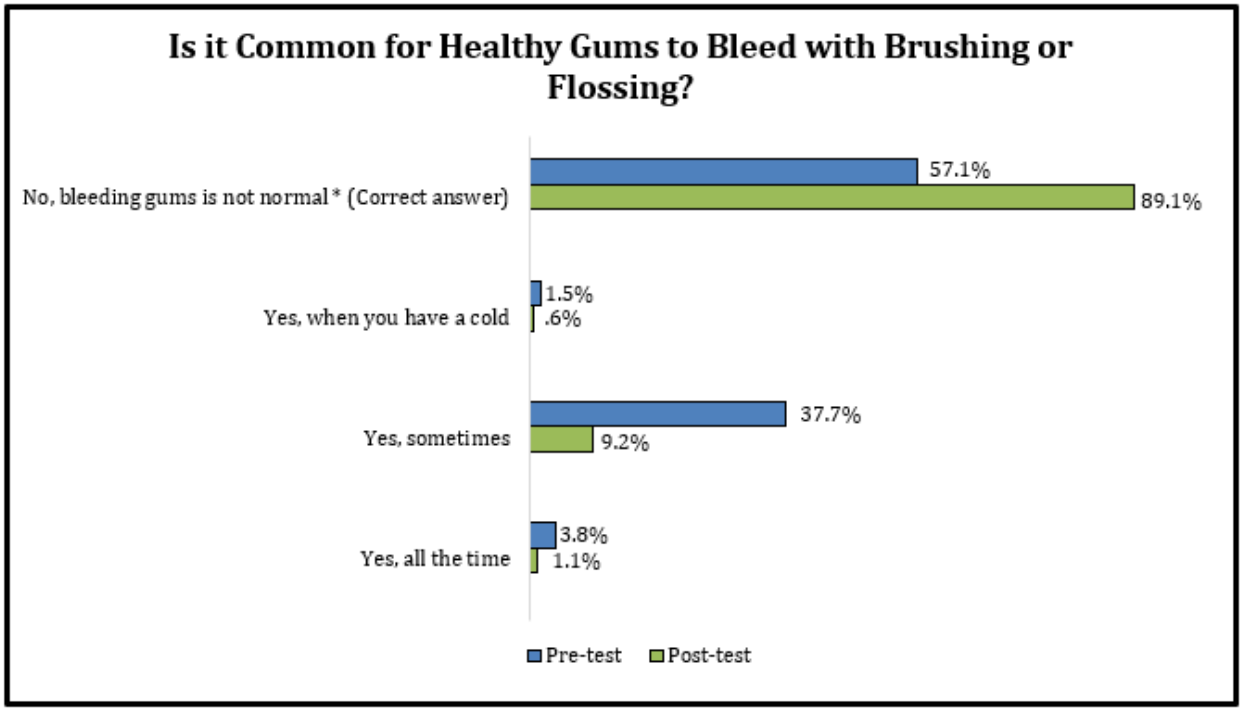
Is it common for healthy gums to bleed with brushing/flossing?

For the assessment, when asked if it is healthy for gums to bleed with brushing/flossing, the correct response is, "No, bleeding gums is not normal." A little more than half of the students selected the correct response during the pre-test (57.1%), compared with 89.1% who selected this response during the post-test. It is important for students to know bleeding gums is not normal. The absolute percentage change between correct answers from the pre- to post-test was 32.0%, representing a success in the intervention of greater than 15% (Figure 7).

According to the American Dental Association (ADA), "In some cases, bleeding gums can be a sign of gingivitis, the early stages of periodontal disease. If your gums bleed easily or bleed when you brush, talk to your dentist about your oral health. Gingivitis is preventable" (ADA, ndb). It is especially important for adolescents to know the signs and symptoms of gum disease.

"Hormonal changes related to puberty can put teens at greater risk for getting periodontal disease. During puberty, an increased level of hormones, such as progesterone and possibly estrogen, cause increased blood circulation to the gums. This may cause an increase in the gum's sensitivity and lead to a greater reaction to any irritation, including food particles and plaque." (AAP, 2021)

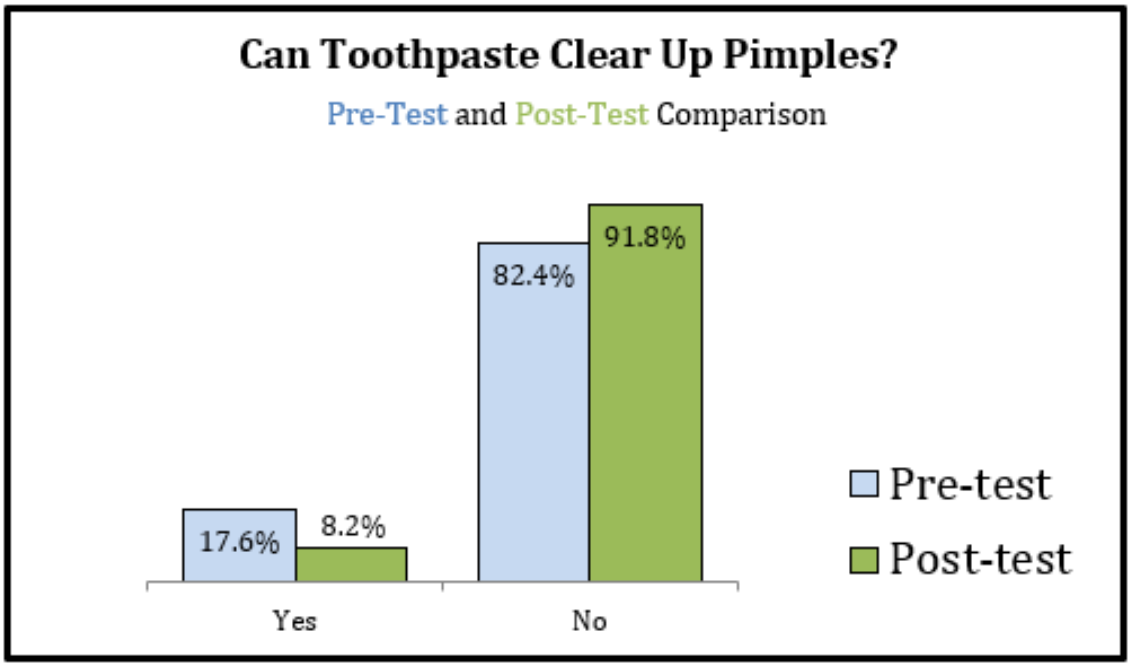
Figure 7



Can toothpaste clear up pimples?

There is no scientific evidence that toothpaste will help with pimples. More than three quarters of students selected the correct answer in the pre-test (82.4%), and nearly all students selected the correct response on the post-test (91.8%). The absolute percentage change between correct answers from the pre- to post-test was 9.4%, representing a lack of success in the intervention (Figure 9). This information will need to be made clearer in the presentation in order to achieve at least a 15% improvement in pre- and post-test knowledge.

Figure 8



The question of whether toothpaste can clear up pimples was used to spark a conversation that products should only be used as directed. There are many false claims on social media and other illegitimate sources that youth look to for advice. It is recommended that if students have questions about oral health products or homemade dental products to talk to their dentist or dental hygienist or contact the Utah Department of Health Oral Health Program.

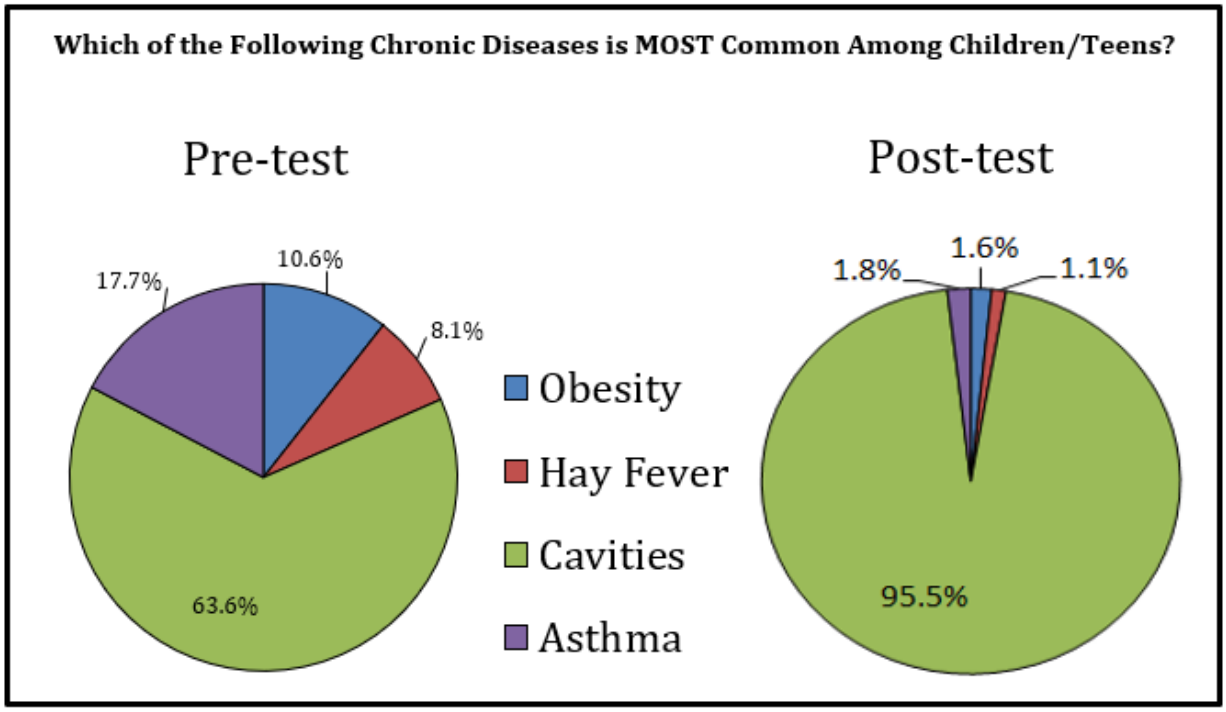
Which of the following chronic diseases is most common among children/teens?

Tooth decay is the most common chronic disease among children and teens. In fact, the Surgeon General in Oral Health: The Silent Epidemic stated, “Although largely preventable, dental caries and periodontal disease are the two biggest threats to oral health and are among the most common chronic diseases in the United States. Dental caries is the most common chronic disease in children: it is about five times as common as asthma and seven times as common as hay fever.” (Benjamin, 2010)

The National Center of Health Statistics reported, “Among adolescents aged 12–19, 58% had experienced dental caries in permanent teeth in 2011–2012” (Dye et al., 2015). Tooth decay is largely preventable. This educational intervention works to help students understand they can prevent tooth decay. The question was used to determine whether students understood the significant effect that poor oral health has on both populations and individuals.

More than half of the students selected the correct response on the pre-test (64.3%). Nearly all the students selected the correct response on the post-test (95.5%). This resulted in a 31.2% increase in students marking the correct answer from the pre-test to the post-test assessment and is considered a success (Figure 9).

Figure 9

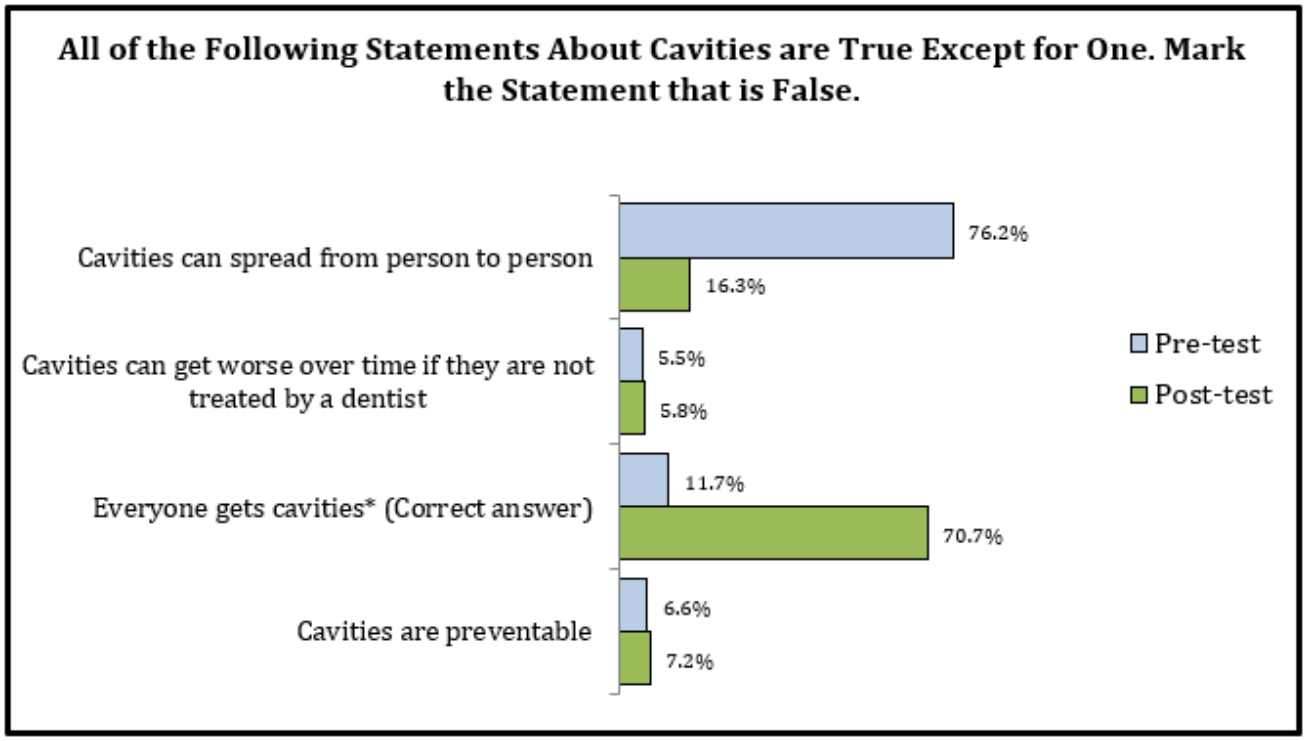


All of the following statements are true about cavities except for one. Mark the statement as false.

"Everyone gets cavities" is the false statement students should have selected out of several other statements. Cavities are largely preventable, and not everyone gets cavities. Individual choices and behaviors largely influence the risk of dental decay. The majority of students incorrectly chose, "Cavities can spread from person-to-person" as being false on the pre-test when in fact, cavities are transmissible. In the publication, Pediatric Dentistry 2006, it states, "Dental caries is an infectious and transmissible disease" (Berkowitz, 2006).

On the pre-test, 11.7% of students selected the correct answer. On the post-test, 70.7% of students marked the correct answer. This resulted in a 59% increase in students choosing the correct answer on the post -test. This is considered successful (Figure 10).

Figure 10

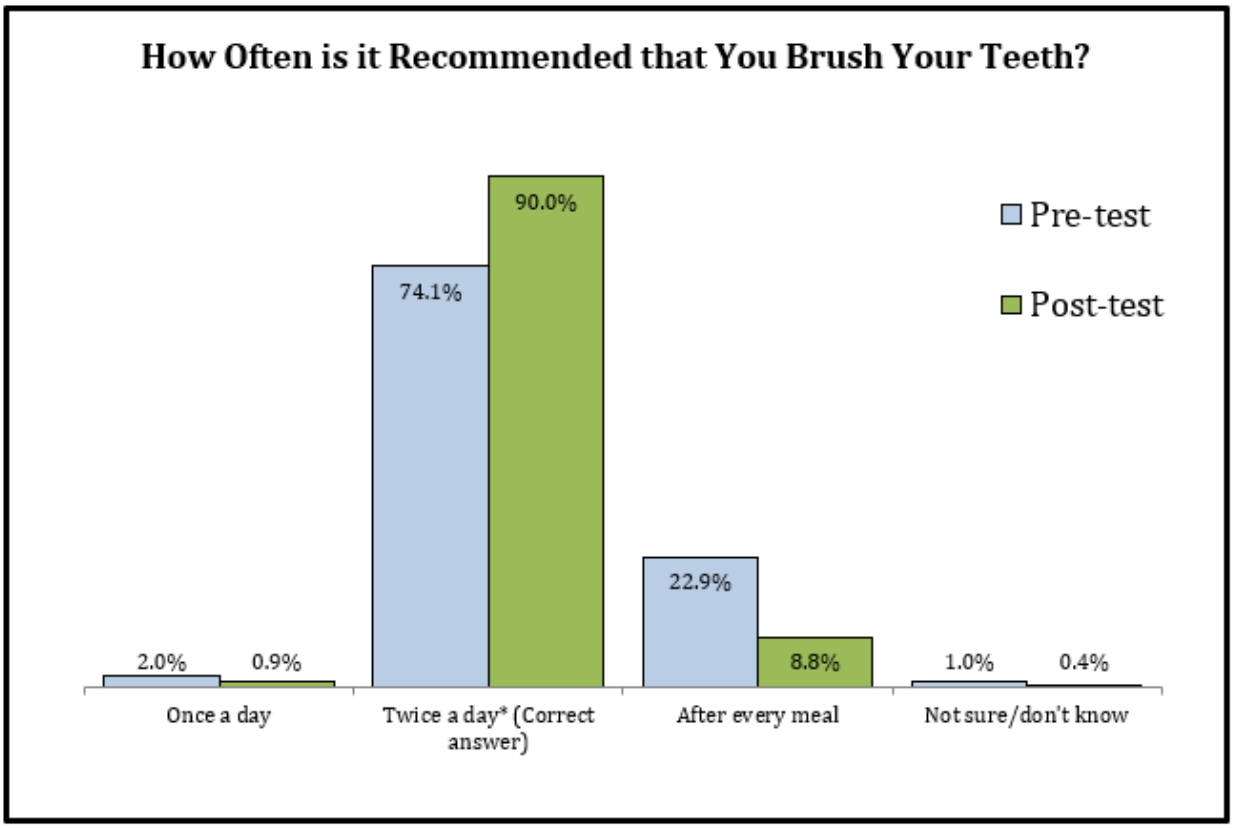


How often is it recommended that you brush your teeth?

This question invited students to think about the importance of dental hygiene at home in overall oral health. The American Dental Association (ADA) recommends brushing twice a day. 2020-AOHC pre-test results indicate the majority of the students (74.1%) were already aware that brushing twice a day is recommended. Nearly one quarter of students indicated on the pre-test that brushing after every meal was preferred (22.9%). Although the ADA recommends this frequency for certain cases, such as individuals who wear orthodontic appliances, the recommendation for the general public is to brush teeth twice a day for two minutes (ADA, n.d.c).

The post-test demonstrated a clear shift in students' knowledge, with a majority of students (90.0%) marking the correct answer that brushing twice a day is recommended (Figure 11). This resulted in a 15.9% increase in students marking the correct answer from the pre-test to the post-test assessment and is considered a success.

Figure 11



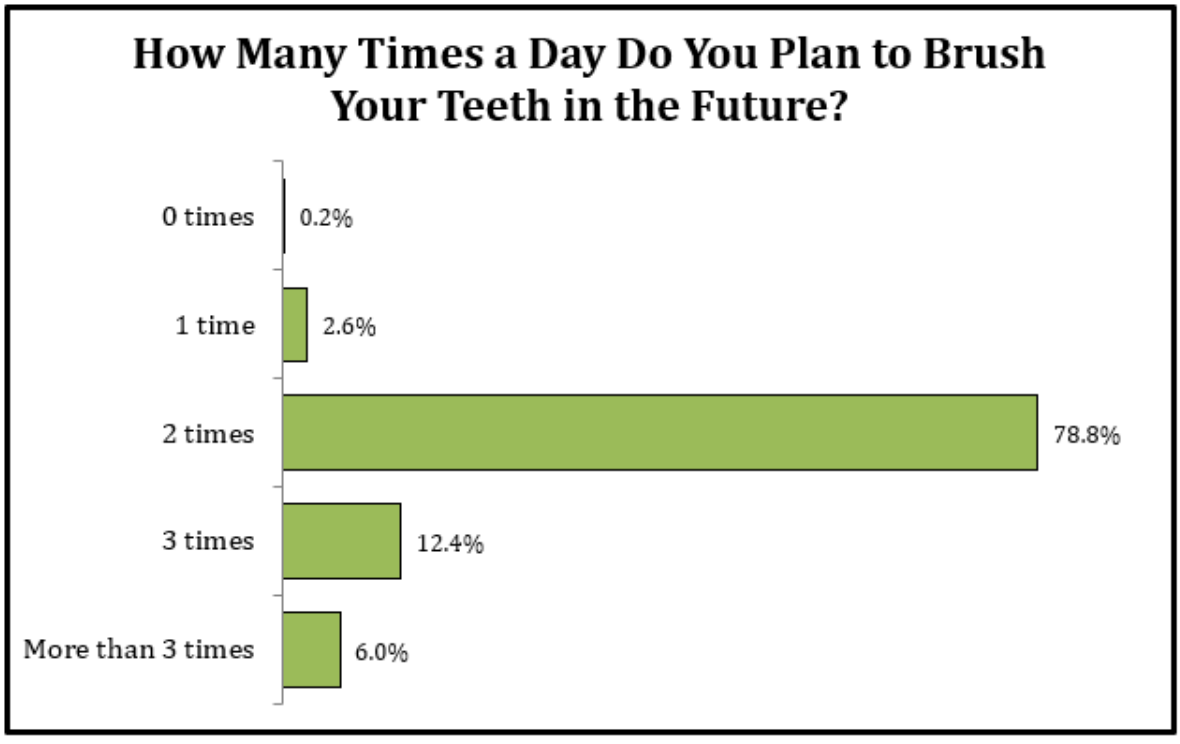
Post Test Measuring Students Intent Questions

The following questions were added for the first time to the 2019-AOHC instrumentation tool to measure students' intentions. One of the goals of this educational intervention is to increase positive oral health behaviors of youth. We asked students what their intent was to follow through with good oral health behavior that was discussed during this intervention, such as brushing, flossing, and reducing soda consumption. With the hopes of increasing the adoption and maintenance of positive oral health behaviors, this intervention uses the Health Belief Model to address perceived barriers to good oral hygiene habits by providing solutions to those barriers. These intent questions provide the OHP with another set of measurements to determine the success of this intervention (La Morte, 2019).

How many times a day do you plan to brush your teeth in the future?

This question asks the students about their intent of brushing their teeth in the future, which is an important behavior for good oral health (Figure 12).

Figure 12

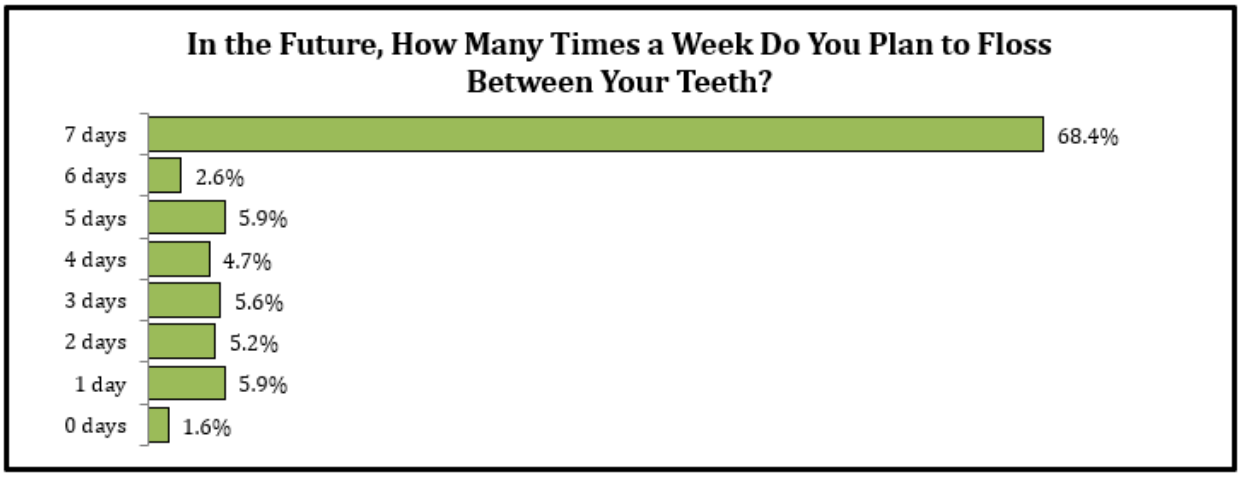


Of the 1,663 students who responded to this question, a large majority (78.8%) recalled the education portion of the intervention, and planned on following the guideline of brushing twice a day. A few (18.4%) plan to do even more and brush three times per day. There was a small group (2.8%) that, for whatever reason, still did not feel that they can, or want to brush their teeth for the recommended time every day. Three students (0.2%) responded that they will not brush their teeth at all each day.

In the future, how many times a week do you plan to floss between your teeth?

More than half of students (68.4%) reported they will floss their teeth every day, with 30% of students planning to floss between one and six times during the week. However, 1.6% said they will not floss their teeth during the week. These two questions demonstrate that most students learned the importance of brushing twice a day and flossing daily (Figure 13).

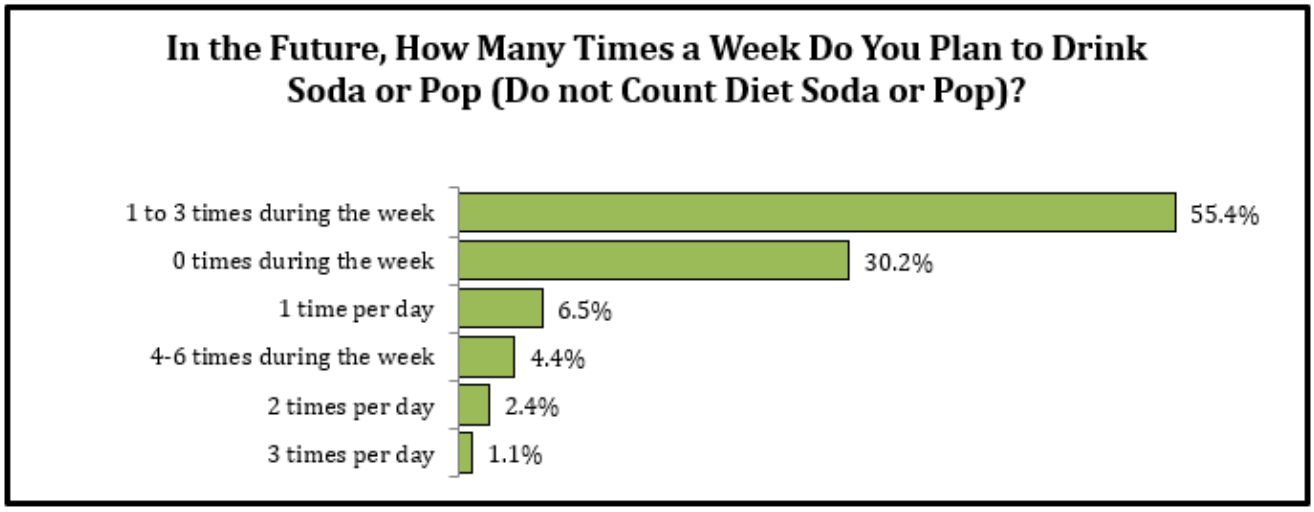
Figure 13



In the future, how many times a week do you plan to drink a can, bottle, or glass or soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)

Consumption of sugary foods and drinks increases the risk of tooth decay. This question specifically asks about regular soda and states that diet soda is not included since there is no actual sugar content in diet soda, and sugar is the main point of discussion for the question and the lesson. However, it should be noted that diet sodas are still carbonated and contain acid that is damaging to the teeth. The two most common answers were a plan to drink no soda at all (30.2%) or to drink soda a moderate 1-3 times during the week (55.4%). Most students learned the harm of sugary beverages and reported their plan to reduce or eliminate it from their diets (Figure 14).

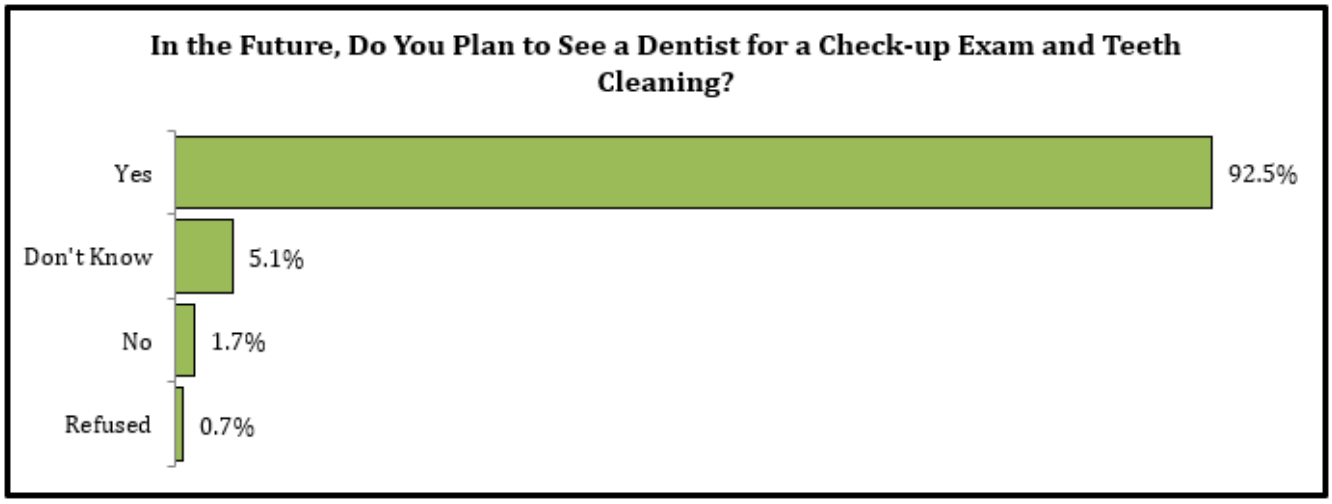
Figure 14



In the future, do you plan to see a dentist for a check-up exam, and teeth-cleaning?

This question is in line with Utah's NPM-13B and asked the students about their intent of accessing dental services in the next year after having this intervention and having low-cost dental resources made available. The majority of students (92.5%) stated that they planned to be able to see a dentist, and it is very fortunate that they are confident that they will be able to do so. The next largest group (5.1%) reported that they did not know whether they would be able to plan to see a dentist. This is important to note because there were a significant number of children, cited above in this report, who said that they needed dental care but were not able to receive it (Figure 15).

Figure 15



POST TEST QUALITATIVE QUESTIONS

In an effort to acquire knowledge about students' opinions regarding the oral health presentation and adjust future presentations accordingly, two post-test questions ask about the information included in the oral health presentations that is most and least helpful (Figures 16 and 17). The majority of students noted that all of the information was helpful.

Figure 16

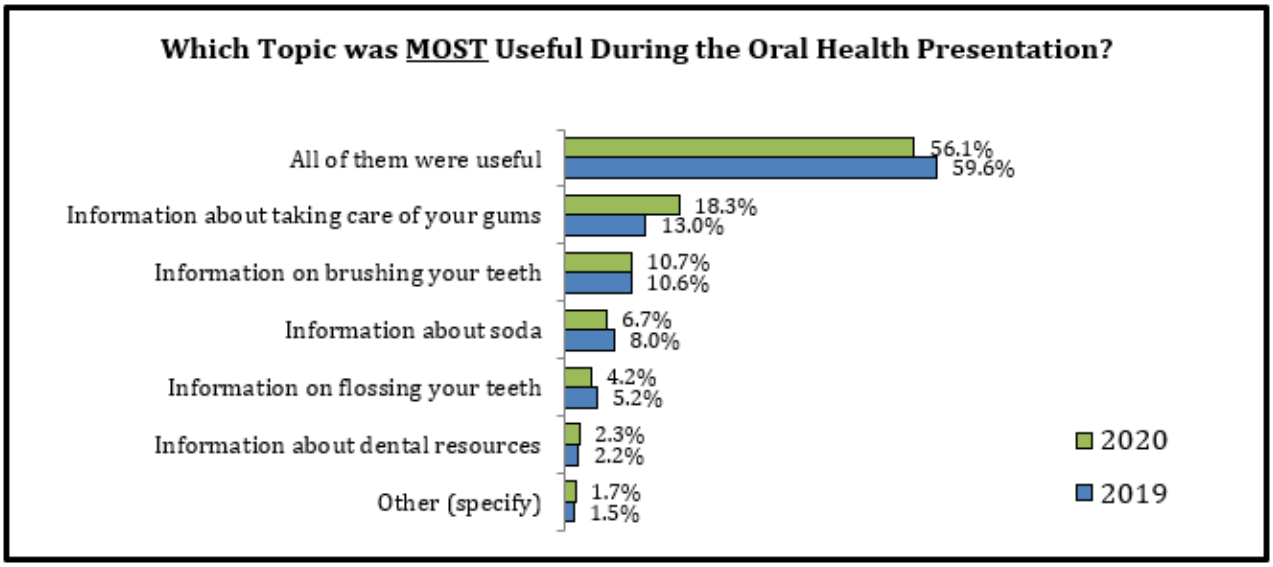
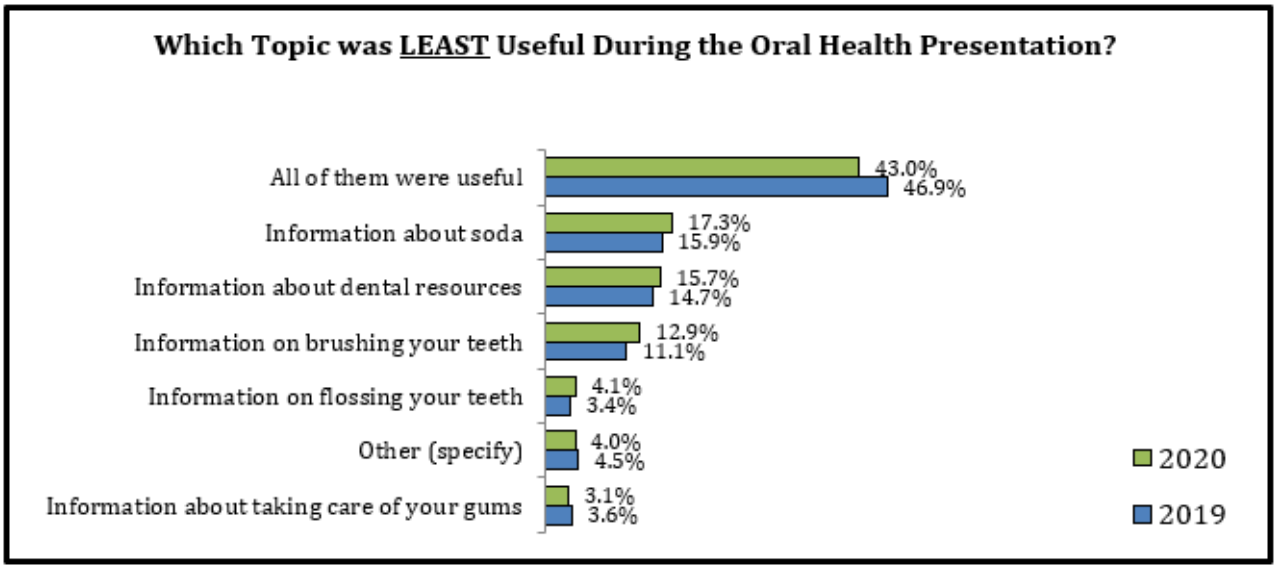


Figure 17



LIMITATIONS

Some limitations should be noted. The first limitation relates to school selection. The program's Oral Health Educator contacted specific schools and school districts based on their geographical location. If the school's health teacher agreed to the presentation, OHP presented at that school. As a result, schools were not randomly selected to participate in the intervention, and the students who received the intervention program may not be representative of all Utah's adolescents. There was also a discrepancy between the number of completed pre-tests and post-tests that were returned to the oral health educator. While 1,733 pre-tests were completed by students, only 1,665 completed post-tests were returned.

Pre-tests and post-tests are not linked due to classroom restraints. As a result, the findings of this educational intervention are the averages of all the pre-tests and all the post-tests. Therefore, we are unable to see if a student marks a correct answer on a pre-test and then marks a false answer on a post-test. We also cannot account for questions being left blank on a pre-test and then completed by a student on the post-test. In 2020, the pre-test and post-test were only available online and all students participated in the online format. This reduces the probability of answers being left blank, and almost eliminates potential data entry errors by OHP interns entering data into REDCap from paper surveys.

It should also be noted that bias due to self-reporting is always present. Therefore, it is possible the results of health behavior questions, such as questions about soda consumption or last dental visit, are not entirely accurate. Additionally, since the surveys were self-reported, some students returned incomplete pre-tests and post-tests.

CONCLUSIONS

The Adolescent Oral Health Campaign is an effective way to assess and increase adolescents' knowledge of oral health topics. Offering this intervention on a yearly basis will allow OHP to track trends in changes in knowledge on oral health topics among Utah adolescents. These findings will continue to be used to modify information presented in subsequent campaigns.

ACKNOWLEDGEMENTS

This report is the result of collaboration between the Oral Health Program and the Data Resource Program within the Bureau of Maternal and Child Health at the Utah Department of Health. We would like to thank school administrators, teachers, and students for their participation in the Adolescent Oral Health Campaign. In addition, we would like to thank the Oral Health Program Educator, Lauren Neufeld for designing this intervention and offering the presentation to participating schools. A special thank you to OHP interns Chad Packer and Melissa Baker for presenting at participating schools.

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APPENDIX B: PRE-TEST & POST-TEST ASSESSMENT TOOLS

Pre - Test

Age: Gender: Male/ Female/ Other Home Zip Code:

1. Is it common for healthy gums to bleed when brushing / flossing? (select one)
   - A) Yes, all the time
   - B) Yes, sometimes
   - C) Yes, when you have a cold
   - D) No, bleeding gums is not normal

2. Can toothpaste clear up pimples? (select one)
   Yes No

3. Which one of the following chronic diseases is most common among children / teens? (select one)
   - A) Obesity
   - B) Hay Fever
   - C) Cavities
   - D) Asthma

4. All of the following statements are true about cavities except for one. Mark the statement that is false. (select one)
   - A) Cavities are preventable
   - B) Cavities can spread from person to person
   - C) Everyone gets cavities
   - D) Cavities can get worse over time if they are not treated by a dentist

5. How often is it recommended that you brush your teeth? (select one)
   - A) One time a day
   - B) Two times a day
   - C) After every meal
   - D) Not Sure / Don't Know

6. Overall, how would you rate the health of your teeth and gums? Would you say...
   - A) Excellent
   - B) Very Good
   - C) Good
   - D) Fair
   - E) Poor
   - F) Refused
   - G) Don't Know

7. When was the last time you saw a dentist for a check-up, exam, teeth cleaning? (select one)

A) During the past 12 months
B) Between 12 months and 24 months ago
C) Within the past 3 to 5 years
D) More than 5 years ago
E) Never

8. During the past 12 months, was there a time when you needed dental care but could not get it at that time?

Yes No

9. During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not include diet soda or diet pop.) (select one)

A) I did not drink soda or pop during the past 7 days
B) 1 to 3 times during the past 7 days
C) 4 to 6 times during the past 7 days
D) 1 time per day
E) 2 times per day
F) 3 times per day

10. Have you ever smoked an electronic cigarette or vaped?

A) No
B) Yes, I have tried them but do not smoke them regularly
C) Yes, I smoke e-cigarettes regularly

11. How often during the last year have you been self-conscious or embarrassed because of your teeth or mouth? Would you say…

A) Very often
B) Fairly often
C) Occasionally
D) Hardly ever, or
E) Never?
F) Refused
G) Don't Know

12. What is your Race? (select one)

A) American Indian or Alaska Native
B) Asian
C) Black or African American
D) Native Hawaiian or Other Pacific Islander
E) White
F) Two or more races
G) Hispanic/Latino
H) Other _____

Post-Test

Age: Gender: Male/ Female/ Other Home Zip Code:

1. Is it common for healthy gums to bleed when brushing / flossing? (select one)
   A) Yes, all the time
   B) Yes, sometimes
   C) Yes, when you have a cold
   D) No, bleeding gums is not normal
2. Can toothpaste clear up pimples? (select one)
   Yes No
3. Which one of the following chronic diseases is most common among children / teens? (select one)
   A) Obesity
   B) Hay Fever
   C) Cavities
   D) Asthma
4. All of the following statements are true about cavities except for one. Mark the statement that is false. (select one)
   A) Cavities are preventable
   B) Cavities can spread from person to person
   C) Everyone gets cavities
   D) Cavities can get worse over time if they are not treated by a dentist
5. How often is it recommended that you brush your teeth? (select one)
   A) One time a day
   B) Two times a day
   C) After every meal
   D) Not Sure / Don't Know
6. How many times a day do you plan to brush your teeth in the future?
   A) 0 times
   B) 1 time
   C) 2 times
   D) 3 times
   E) More than 3 times
7. In the future, how many times a week do you plan to floss between your teeth?
   A) 0 days
   B) 1 day
   C) 2 days
   D) 3 days
   E) 4 days
   F) 5 days
   G) 6 days
   H) 7 days

8. In the future, how many times a week do you plan to drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)

A) 0 times during the week
B) 1 -3 times during the week
C) 4 - 6 times during the week
D) 1 time per day
E) 2 times per day
F) 3 times per day

9. In the future, do you plan to see a dentist for a check-up exam, and teeth- cleaning?

A) Yes
B) No
C) Refuse
D) Don't Know

10. What is your Race? (select one)

A) American Indian or Alaska Native
B) Asian
C) Black or African American
D) Native Hawaiian or Other Pacific Islander
E) White
F) Two or more races
G) Hispanic/Latino
H) Other _____

11. What topics were the MOST useful to you during the oral health presentation? (select one)

A) Information on brushing your teeth
B) Information on flossing your teeth
C) Information about soda
D) Information about taking care of your gums
E) Information about dental resources
F) All of them were useful
G) Other (specify)

12. What topics were the LEAST useful to you during the oral health presentation? (select one)

A) Information on brushing your teeth
B) Information on flossing your teeth
C) Information about sodaD) Information about taking care of your gums
E) Information about dental resources
F) All of them were useful
G) Other (specify)

APPENDIX C: REFERENCES FOR PRE-TEST & POST-TEST ASSESSMENT TOOLS

Question 3. Which of the following chronic diseases is most common among children/teens? “Tooth decay is one of the most common diseases of childhood—5 times as common as asthma, and 7 times as common as hay fever” CDC - The oral health educator created this question from the statistics to show the students the prevalence of dental decay. https://www.cdc.gov/chronicdisease/pdf/2009-power-of-prevention.pdf (Page 5) Accessed on 07.17.2019

Question 6. Overall, how would you rate the health of your teeth and gums?OHQ.845 https://wwwn.cdc.gov/nchs/data/nhanes/2017-2018/questionnaires/OHQ_J.pdf NHANES 2017-2018 Oral Health Questions Accessed on 07.17.2019

Question 7. When was the last time you saw a dentist for a check-up, exam, teeth cleaning? Taken from the 2019 Standard High School YRBS Question 86. With the omission of “other dental work” Accessed on 07.23.2019

Question 8. During the past 12 months, was there a time when you needed dental care but could not get it at that time? OHQ.770 https://wwwn.cdc.gov/nchs/data/nhanes/2017-2018/questionnaires/OHQ_J.pdfNHANES 2017- 2018 Oral Health Questions Accessed on 07.17.2019

Question 9. During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not include diet soda or diet pop.)Question 76. Standard Youth Risk Behavior Survey (YRBS) 2017 page 18https://www.cdc.gov/healthyyouth/data/yrbs/pdf/2017/2017_yrbs_standard_hs_questionnaire.pdf Accessed on 07.23.2019

Questions 11 & 12. What is your race? What is your ethnicity?Is used by the United States Census Bureau 2020 and is from the Office of Management and Budget.https://www2.census.gov/programs-surveys/decennial/2020/program-management/memo-series/2020-memo-2018_02.pdf Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity Office of Management and Budget https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdfAccessed on 07.17.2019

APPENDIX D: EDUCATIONAL TRIFOLD

The Tri-fold local resource portion is specific to each county. Currently we have created trifolds for Davis, Salt Lake, Summit, Tooele, Utah, Weber, and Morgan counties. These trifolds are also available in Spanish for the following counties Davis, Salt Lake, Utah and Weber - Morgan counties. All county resources are available in Spanish upon request.

Important Questions

What if I don't have healthy food at home?

Make sure that you are making healthy food choices at school.

What if I don't have a toothbrush, toothpaste or floss?

Discuss this with a trusted adult. There are many organizations that give out free toothbrushes, toothpaste, and floss. If you don't have toothpaste brush your teeth with water until you are able to get more toothpaste.

Learn More

There are some great websites with more oral health information.

http://health.utah.gov/oralhealth/

www.ilikemyteeth.org

www.mouthhealthy.org

Get Involved

If you want to get involved in your community promoting good oral health here is a website to get you started.

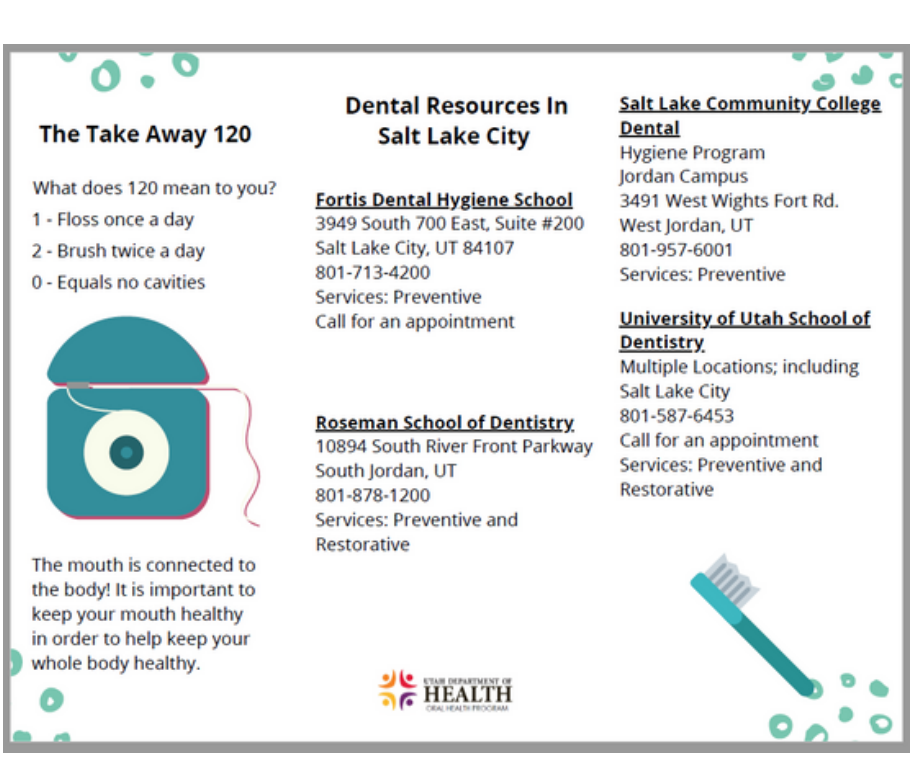
www.americastoothfairy.org

UTAH DEPARTMENT OF HEALTH ORAL HEALTH PROGRAM

Keep Your Mouth Healthy

Utah Department of Health
Oral Health Program
3760 S. Highland Drive
Salt Lake City, Ut 84114

Phone: 801.273.2995
E-mail: lneufeld@utah.gov



The Take Away 120

What does 120 mean to you?

1 - Floss once a day

2 - Brush twice a day

0 - Equals no cavities

The mouth is connected to the body! It is important to keep your mouth healthy in order to help keep your whole body healthy.

Dental Resources In Salt Lake City

Fortis Dental Hygiene School
3949 South 700 East, Suite #200
Salt Lake City, UT 84107
801-713-4200
Services: Preventive
Call for an appointment

Roseman School of Dentistry
10894 South River Front Parkway
South Jordan, UT
801-878-1200
Services: Preventive and Restorative

UTAH DEPARTMENT OF HEALTH ORAL HEALTH PROGRAM

Salt Lake Community College Dental
Hygiene Program
Jordan Campus
3491 West Wights Fort Rd.
West Jordan, UT
801-957-6001
Services: Preventive

University of Utah School of Dentistry
Multiple Locations; including Salt Lake City
801-587-6453
Call for an appointment
Services: Preventive and Restorative

ADOLESCENT ORAL HEALTH CAMPAIGN

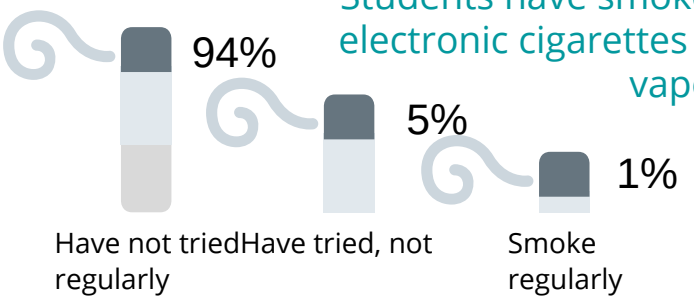
2020 2021

A one-time intervention encouraging positive adolescent oral health behaviors

Educational Topics:

- Proper brushing & flossing
- Gum disease
- Cavities
- Braces Care
- Nutrition

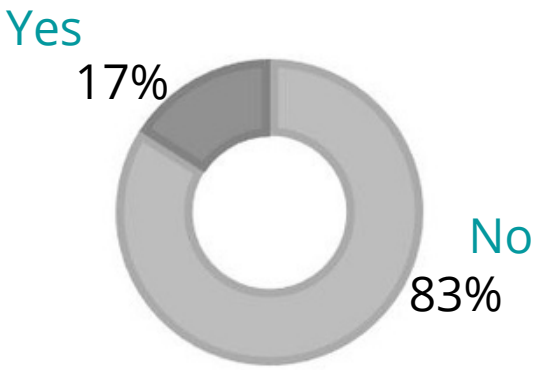
Students have smoked electronic cigarettes or vaped



1 in 5 students did NOT visit the dentist in the past 12 months

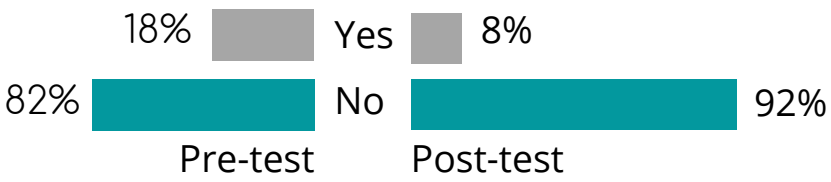
Students rate the health of their teeth and gums

Students who needed dental care in the last 12 months & could not get it



Students' survey responses before and after educational intervention

Can toothpaste clear up pimples?



32% of students were self-conscious or embarrassed of their teeth or mouth very often, fairly often or occasionally in the last year

Data displayed are results of surveys from Adolescent Oral Health Campaign 2020 - 2021 educational intervention